Diagnostic Tools for Leptospirosis in Thailand: Evaluation of Rapid Tests

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Background: Leptospirosis presents as a non-specific febrile illness with clinical features similar to other tropical diseases. Early diagnosis of leptospirosis would allow clinicians to initiate effective therapy sooner in the course of illness. Although many kits are available for rapid testing in the acute setting, data on use of these tests in the field compared to gold standard testing are limited.

Methods: As part of a prospective observational cohort of febrile illness patients in two areas of Thailand, acute and convalescent serum and acute urine samples were collected. At the rural hospitals, sera were tested with Panbio Multi-SDLST (MULTI) and Thailand NIH latex agglutination test (LAT). MAT testing of paired sera, the gold standard for diagnosis of leptospirosis, was performed at Thai NIH as was blinded repeat LAT testing of 88 samples. Urine samples were tested for leptospiral antigen using Leptodot.

Results: Paired sera from 428 febrile patients were tested using MAT. Twenty-seven febrile patients had a four-fold rise by MAT. These patients had clinical evidence of leptospirosis (conjunctival suffusion in 14% compared to 7% of MAT – (<4x rise), $p=0.15$; elevated creatinine in 37% vs. 20%, $p= 0.03$; elevated bilirubin in 33% vs. 10%, $p<0.01$) as well as compatible risk factors (water or mud exposure in 74% vs 46%, $p<0.01$; lower extremity cuts or abrasions in 52% vs. 21%, $p<0.01$). Sensitivity of rapid tests at the acute visit were as follows: MULTI 7%, LAT at hospital 7%, LAT at NIH 26%, Leptodot 25%. For the convalescent visit, sensitivity improved to 25% for LAT at the hospital, 78% at NIH, and 65% for MULTI. MULTI and LAT were 94-9% specific at each visit at the hospitals. LAT at NIH was 40-50% specific and Leptodot was 88% specific.

Conclusions: MAT testing identified patients with clinical findings and risk factors compatible with leptospirosis. No rapid test had very good sensitivity at the acute visit. Quality control is important for accuracy of rapid tests.

Presented at International Conference on Emerging Infectious Diseases, February 29 - March 3, 2004, Atlanta, GA (session #35 poster #103).